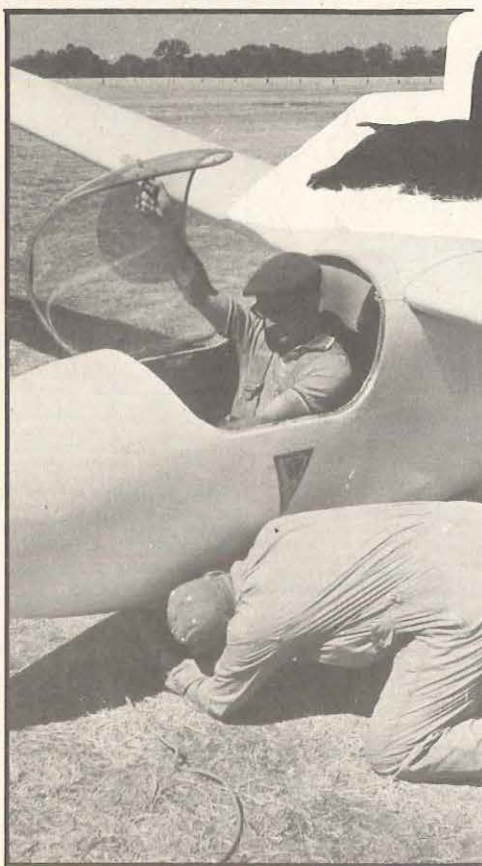




DEPARTMENT OF CIVIL AVIATION AUSTRALIA

Number 84 April 1973

AVIATION SAFETY DIGEST





Cover and above:

The Glider Pilots: Now taking pride of place as Australia's fastest-growing aviation activity, the incomparable sport of gliding finds a response in every true flying enthusiast. Drawn from almost every walk of life and representing the widest possible range of aviation experience, devotees find in the sport much the sort of challenge and spirit of adventure that characterised the aero club flying of pre-war years. Frequently too, there is the same esprit de corps of yesteryear (so often lacking in some flying schools today) resulting no doubt from the quality of enthusiasm and sense of participation that gliding club members enjoy. With the cost of power flying for pleasure beyond the pocket of many, and the constraints inevitably imposed by the airspace controls that are so necessary to the safe ordering of today's air traffic, it is not surprising that many enthusiasts are finding their answer in the comparative freedom and sense of achievement, as well as the economy, that glider flying offers. But far from being a way of life utterly removed from the realities and demands of powered aviation, gliding, especially in Europe, has traditionally been the means by which young pilots have been introduced to the skills of flight. Today, with the advent of the self-launching motor glider, such as the Sportavia RF5B and the Slingsby T61A depicted on our covers, the gap between gliding and power flying is narrowing even further. Each of these disciplines has much to learn from the other and though this issue of the Digest is addressed primarily to the gliding fraternity it is hoped that their power-flying colleagues will find in it much food for thought too.

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HE DIDN'T RECOVER..

Half an hour after being winch-launched from a glider field in South Australia, a Blanik sailplane spun to the ground and crashed. The pilot, who was the only occupant, was seriously injured and the glider was badly damaged.

The glider was one of several being operated at the field, and after undergoing a daily inspection on the morning of the accident, it had made several local soaring flights in the hands of different pilots. The day was warm and cloudless with a light south-easterly breeze and plentiful thermals allowing soaring to about 4,000 feet.

A little after midday, it was the turn of the pilot subsequently involved in the accident to fly the Blanik and, with the assistance of one of the duty instructors he prepared to make a local soaring solo flight. After loading 14 pounds of ballast, the pilot took his seat in the front cockpit and, after the canopy had been secured and the pre-take-off checks completed, the glider was winch-launched into the south.

The launch appeared to be normal in all respects, the glider releasing the cable at about 1,000 feet, after which it began thermalling a mile or so to the west of the aerodrome. A KA6 was also winch launched immediately the Blanik had cleared the take-off area, and it too began soaring flight and thermalling in the vicinity of the aerodrome.

For twenty minutes or so, the Blanik was seen from time to time, apparently

flying normally at between 2,000 and 3,000 feet. But just before 1230 hours, the senior flying instructor on duty at the launching point, having temporarily lost sight of the glider, asked other club members standing nearby, "Where's the Blanik?" Shortly afterwards several members sighted the glider about two miles to the south of the field, spinning to the left from about 2,000 feet. Although one of the pilots watching gained the impression that the spin seemed to slow down or hesitate at times as though the pilot was attempting to recover, the Blanik's steep nose-down attitude did not change, and they saw it continue to spin towards the ground until it was lost to their view behind trees on a low hill. A number of members, including the senior instructor, drove immediately to the accident site. They found the badly damaged Blanik lying in an open field with the unconscious pilot still in his harness in the crushed cockpit.

* * *

Examination of the wreckage showed that the glider had struck the ground nose-first, while spinning to the left. It was evident that all the damage sustained by the glider was the result of impact with the ground and a close examination of the wreckage established that no airframe defect had contributed to the accident.

As well as having been seen by a number of club members on the ground, some of the Blanik's manoeuvres immediately before the accident were observed by the pilot of the KA6. This pilot said that he had been watching the Blanik from time to time, as well as looking out for other aircraft, and it had been thermalling to the right, flying quite normally at about 3,500 feet. Soon after this he saw it in quite a steep turn, apparently still in a thermal. At this stage he was thermalling himself at a little over 3,000 feet. After making two or three more turns, he looked for the Blanik again and saw that it was now spinning to the right a little below his own height. This did not concern him at first because the glider had plenty of height in which to recover, but when it still continued to spin after several more turns, he began to wonder if anything was wrong. Soon afterwards however, the pilot of the KA6 saw that the Blanik, now well below him at about 2,000 feet, was in a wings-level nose-down attitude. The pilot looked around briefly to check his position, hoping to find another thermal and, when he next looked for the Blanik he saw that it was now spinning to the left. After it had spun through three more turns of a very stable spin, he began to fear for its

safety. The spin continued unchecked and as he watched, the Blanik and its shadow on the ground converged upon one another until the glider impacted heavily on its nose and port wing tip. It then bounced back on to its tail, before coming to rest in a level attitude.

* * *

The pilot involved in the accident was a middle aged man and had taken up gliding just over two years before the accident. During this time, he had made 260 launches and accumulated 37 hours glider flying, of which 78 launches and 13 hours were solo flying. He had no previous flying experience of any type.

The pilot did not regain consciousness for two days after the accident. When he did recover, he was found to be suffering from amnesia and could remember nothing of the accident or of the events that led up to it. For this reason and the fact that no fault lay with the glider itself, the investigation of the accident was limited to the eye witness evidence

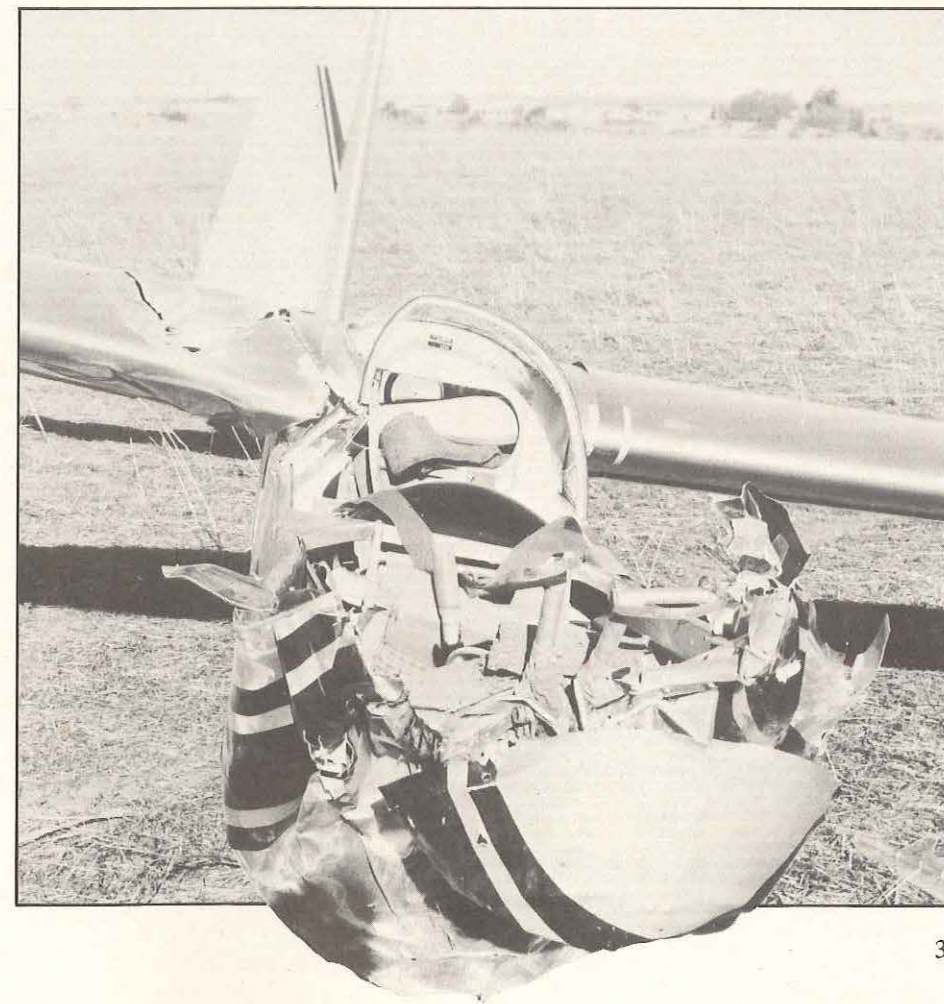
and what could be learnt of the pilot's techniques.

Although the pilot was regarded as a very enthusiastic glider pilot, and was in the habit of spending nearly every weekend at the gliding club, the progress of his training had not been without its problems. Much of the difficulty was associated with inconsistent performances from day to day, and an apparent difficulty in accepting and absorbing instruction.

Even the instructor who had finally taken over his training and succeeded in sending him solo found, during a check flight three weeks later, that the pilot's flying tended to deteriorate whenever he was faced with an unfamiliar situation indicating that his flying would require close supervision.

Shortly after this time, the pilot had transferred to the club with which he was flying when the accident occurred. Up to this point, all his flying had been carried out on Kookaburra gliders but, as the only training machine available at his new

The crushed and distorted nose section and cockpit of the Blanik clearly indicates the force with which the glider struck the ground.





Top: The main impact was also taken on the glider's port wing. This close-up shows the severe distortion and wrinkling of the wing structure.



Bottom: The distortion of the nose section as seen in this picture indicates the attitude of the Blanik at impact.

club was the Blanik, it was necessary for the pilot to be converted on to it. During the flying training involved in the conversion, the pilot's standard of skill continued to vary as before, with inconsistencies in his circuit planning. As a result, he was required to undergo further dual instruction before being permitted to fly solo.

The instructors supervising his flying during this period said that they had checked him in spin recovery procedures on a number of occasions and nearly always he would recover more quickly than usual after only one rotation. These instructors were certain that the pilot would not deliberately spin-off height or carry out practice spins while flying solo.

The instructors had also noticed that, while thermalling, the pilot tended to use the controls rather coarsely. One of the instructors said that he would try and maintain his speed by reference to the airspeed indicator, rather than by using the horizon for reference. This sometimes resulted in an excessive nose-high attitude when he compensated for an increase in airspeed, and a reduction in airspeed, below that recommended would occur before he could take corrective action. Usually the pilot would realise that his airspeed was low, but occasionally it would fall almost to stalling speed and the instructor would have to point this out to him.

Further enquiries made during the

investigation indicated that other glider pilots, who had trained at about the same time as the one involved in the accident, did not have a very clear idea of the correct technique for recovery from a spin. It was learned that not long before the accident, one of these pilots, while being briefed by the instructor, was asked the correct spin recovery technique and gave as his answer, "full opposite rudder until the rotation stops, then pull it out of the dive keeping a close watch that the placarded speed is not exceeded". The instructor was very concerned about this answer and subsequently confirmed with other instructors that there did seem to be a problem with some students concerning their knowledge of the correct

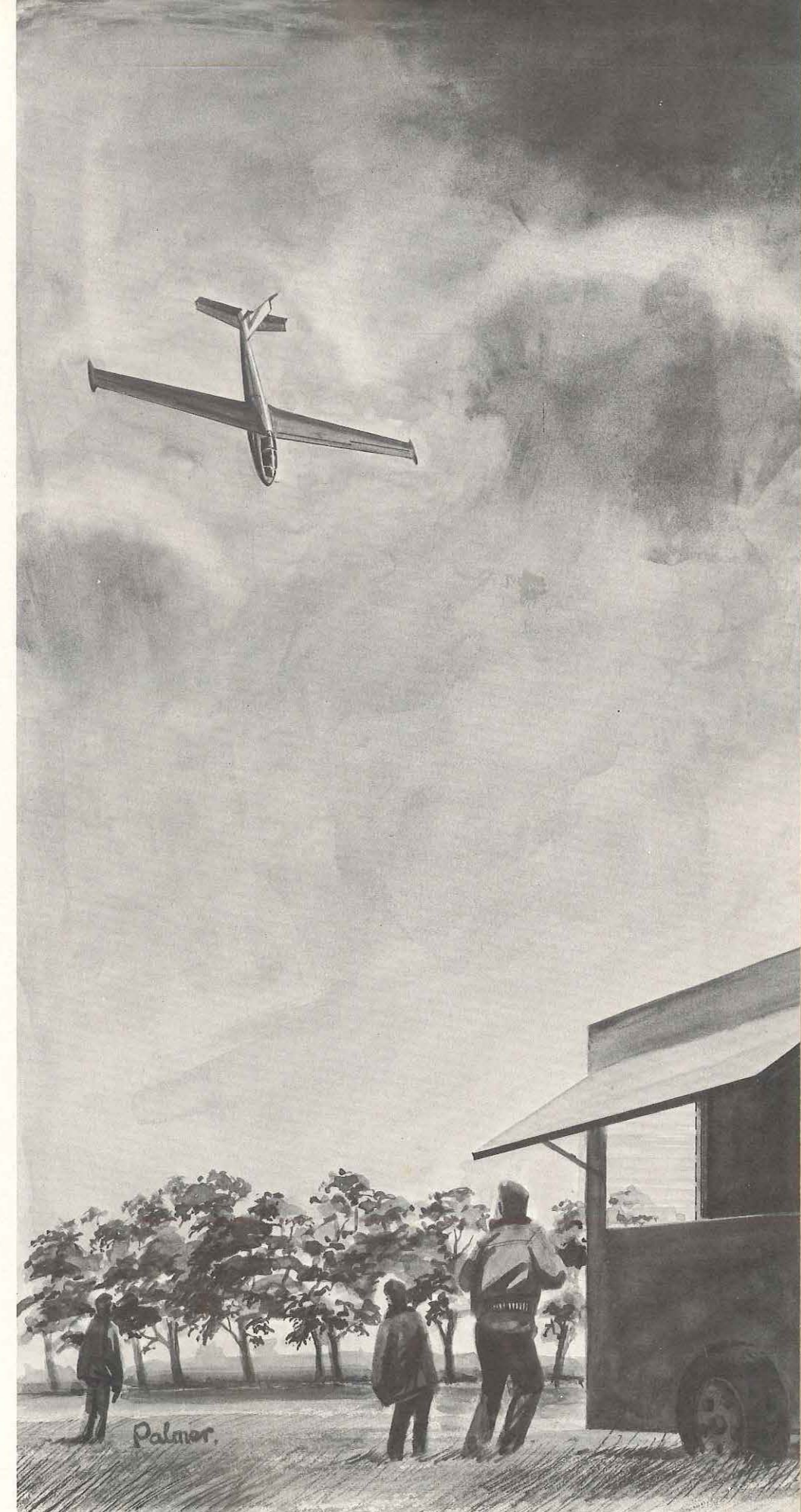
spin recovery technique. The instructor concerned had subsequently passed on his misgivings to the Gliding Federation.

To determine what control inputs could have been made by the pilot of the Blanik involved in the accident, a series of test flights were carried out in another Blanik. As a result of these tests, it was determined that the glider would remain in a fully developed spin if full opposite rudder was applied with the elevator control held on the rear control stop. The glider would in fact remain in this spin, regardless of where the rudder was positioned, for as long as the control column remained fully back. If in-spin rudder was held on, and the control column moved progressively forward, the glider would enter a spiral dive and, with the rudder in any other position, it would recover from a fully developed spin, whenever the control column was moved progressively forward from its rear stop.

From these tests, together with the other evidence that came to light during the investigation, it seems likely that, while thermalling in his normal way, the pilot inadvertently stalled the glider, possibly during the steeper than normal thermalling turns seen by the pilot of the KA6. Because of the fact that the pilot suffered a loss of memory however, the exact sequence of events that led to the glider entering a spin cannot of course be known, and for the same reason, it was not possible to determine why the pilot was unable to effect a recovery. Nevertheless, it seems likely that this was the result of the use of an incorrect recovery technique.

The accident has the same message for gliding clubs as one published in Aviation Safety Digest No. 54 in 1968 — the paramount importance of ensuring that students understand fully what is involved in recovering from a spin. As well as being included in the Digest, this earlier accident was the subject of a circular letter which the Gliding Federation forwarded to all gliding clubs, emphasising the importance of correct spin recovery technique, and requiring all solo glider pilots to undergo spin recovery checks.

The two spinning accidents have much in common and there is little to be derived from this more recent one, that could not have been learnt from the accident publicised five years earlier. The lesson of both these accidents clearly has an application to power flying also. It is salutary to consider the facts as revealed by the investigation of this latest spinning accident, in the light of the Department's "Operational Alert" No. 1 on spin and spiral recovery techniques, issued to pilots on the 16th April.



THAT SENSITIVE TOUCH . . .



THE Skylark belonged to a well-known gliding club and was being flown in the course of a normal day's gliding at the club's field. The weather was fine and mild and the wind almost calm.

On the morning of the accident, the glider had been given a daily inspection and it had then made three local soaring flights. The glider was then readied for its fourth aero-tow for the day, and the pilot subsequently involved in the accident took his seat in the cockpit. The club's Chipmunk tug taxied into position, and the normal pre-take-off checks were completed. The Chipmunk taxied forward to take up slack, then its pilot was signalled that all was clear for take-off and he applied full power.

The glider became airborne after a short roll, and was held down to within a few feet of the ground, ready to take up the low-tow position, normally used in Australian gliding clubs. But it was soon evident to those watching the take-off, that the glider pilot was having difficulty in controlling the aircraft in this position. As well as weaving from side to side, it was tending to pitch up and down as the pilot tried to remain in station.

Just after the tug became airborne, the glider suddenly nosed-up, moved up through the high tow position and climbed steeply. At the same time, its starboard wing dropped and within seconds the glider, now at a height of

During the initial stages of an aero-tow behind a Chipmunk tug, the pilot of a Skylark II lost control of the glider, and it climbed quickly into a steep nose-up attitude. The tow-line parted and the glider fell away to the right and dived into the ground. The pilot was seriously injured and the glider was destroyed.

about 100 feet, was in a very steep nose-up attitude and banked about 25 degrees to starboard. At this point the tow-line parted, and the glider turned sharply to the right, its angle of bank increasing to about 70 degrees. As it turned back towards the direction from which the take-off had begun, the nose dropped and the glider dived towards the ground. Although it then began to recover from the dive, there was insufficient height for it to do so and it impacted loudly on its starboard wing and nose.

Those watching the launch ran immediately to the wreckage where they found the pilot, unconscious and seriously injured, still held by his shoulder harness.

* * *

The pilot of the tug aircraft was not aware of the accident until he had climbed to 500 feet and turned left to join the down wind leg for a landing back on the strip. The tug pilot said that during the take-off he had raised the tail at 30 knots and continued the take-off to an indicated 50 knots before establishing a climb. Up to this stage, he had noticed nothing abnormal in the glider's behaviour, but as he climbed away at about 50 feet, he felt the tail of his aircraft pulled down. This indicated to him that the glider was too low, though not alarmingly so. As he was correcting for this tail-down movement, the glider

moved up into a high tow position, raising the tug's tail slightly and its speed to 55 knots. The pilot applied back pressure to the control column to correct, at the same time glancing in his rear vision mirror to check the glider's position. He saw that it was high and to his left with its starboard wing down. Shortly afterwards, he felt the drag on the towline let go and, a moment later, he saw the glider in his mirror, turning through 180 degrees, back towards the strip. It was steeply banked, and just a little higher than the tug, but as it appeared to be under control, he assumed it would make a safe landing on the strip in the opposite direction to that of take-off. It was not until after he had turned on to the downwind leg, that he sighted the glider's wreckage by the side of the strip.

After he had landed, he checked the tow line and found it had broken at its weak link, immediately ahead of the Ottfur links which attach to the glider's quick-release hook. The rings were later found on the strip where they had fallen from the glider shortly after the tow line parted.

* * *

The pilot of the glider had flown 100 hours on powered aircraft, but he had taken up gliding only two months before the accident. During this time he had accumulated 10 hours gliding experience, involving 26 launches, all of which were

aero-tows. About three hours of his gliding time had been spent on dual instruction on the Blanik glider, and the remainder had been solo flight. At the time of the accident he had flown three and a half hours on the Skylark II and the accident occurred during his ninth aero-tow in this type of glider.

Despite his injuries, the pilot had a clear recollection of some of the events which led to the accident. When interviewed, he said that during the initial stages of the tow, before the tug became airborne, he had experienced difficulty in preventing the glider rising too high off the ground. He had attempted to compensate for this by pushing the control column further forward, but in doing so, he had over-corrected and then had to apply slight back pressure. The glider then rose higher than he thought desirable and before he could correct again, he saw that the tug was close to lifting off. He therefore decided to go into the high-tow position for the initial climb out. But as he moved the control column back to achieve this position, the glider seemed to be caught in the Chipmunk's slip stream. Unexpectedly the glider climbed rapidly in a steep nose-up attitude. As it did so, the glider pilot lost sight of both the tug and the ground. Fearing the glider was going to stall, the pilot went to pull the tow release knob, but just before he did so, the tow-line parted. At this stage the



The trail of wreckage as seen from the point of impact. The airstrip is on the right of the picture and the direction of take-off was towards the camera.

aerodynamic noise had become very quiet and the pilot thought he must be about to stall. He pushed the control column hard forward, and it was only as the nose went down and the ground came into view again, that he realised he was in a turn to the right. The pilot felt there would not be time to correct this turn and land ahead along the take-off path, so he allowed the turn to continue, intending to land on the strip in the opposite direction. At this stage he had the impression his airspeed was increasing. From this point on the pilot was unsure what had happened.

* * *

It was evident from remarks made by other club pilots during the investigation, that the Skylark II was regarded as rather lively during the initial stages of an aero-tow, and that it tended to swing to one side or the other of the tug's slip stream. Nevertheless, the glider was considered to be quite controllable and promptly corrected any deviations from the flight path.

From this information, together with

the evidence of several club members who were watching the launch, it seems that the pilot was over-controlling in his attempts to maintain station before the tug aircraft left the ground. It seems likely that, when the pilot decided to try and solve his station-keeping problem by going into the high-tow position, he again over-controlled and allowed the nose to rise excessively. The towing hook on the Skylark II is under the belly of the glider, and before the pilot had time to take corrective action with firm forward elevator control, the glider rapidly adopted a steep nose-up attitude. This abnormal attitude which is described by pilots of winch-launched gliders as "kiting", imposed too great a load on the tow-line and it parted at the weak link.

This effect apparently took the pilot completely by surprise, as he had not experienced anything like it before, and this, together with the fact that he lost sight of both the tug and ground, probably disorientated him for the moment. As a result, he did not appreciate that the glider was performing what one witness aptly described as a

"wing-over", until he had succeeded in lowering the nose. Because of the attitude in which the glider was now placed however, the pilot was unable to regain control in the height available.

The aero-tow procedure used by the club concerned at the time, enabled a pilot under training to build up flying time comparatively quickly, with each flight averaging about half an hour. However, this also meant that the student was only receiving training in one take-off and one landing for approximately each half hour of training time.

Presumably in deference to his power-flying experience, the pilot involved in the accident had been converted to the Skylark after only six solo flights in the Blanik, and had then made nine further solo flights in the Skylark without any further type of check. In view of what subsequently happened however, it seems possible that too much confidence might have been placed in his glider flying ability because of his other flying background, and that at this stage of his glider training, he should have been subject to greater supervision.

* * *

The wreckage as seen from the point on the airstrip at which the tow-line failed.



There is a further object lesson to be learned from this accident. Despite the fact that the pilot was still a novice as far as aero-towing was concerned, he attempted to recover the situation, when control of the glider was getting beyond him, by attempting a manoeuvre that he had not before experienced. This suggests there is a need to impress upon glider pilots under training, that they should never attempt a manoeuvre that has not been demonstrated to them, and that, should they encounter difficulties during the initial stages of an aero-tow, they should release the tow immediately. —

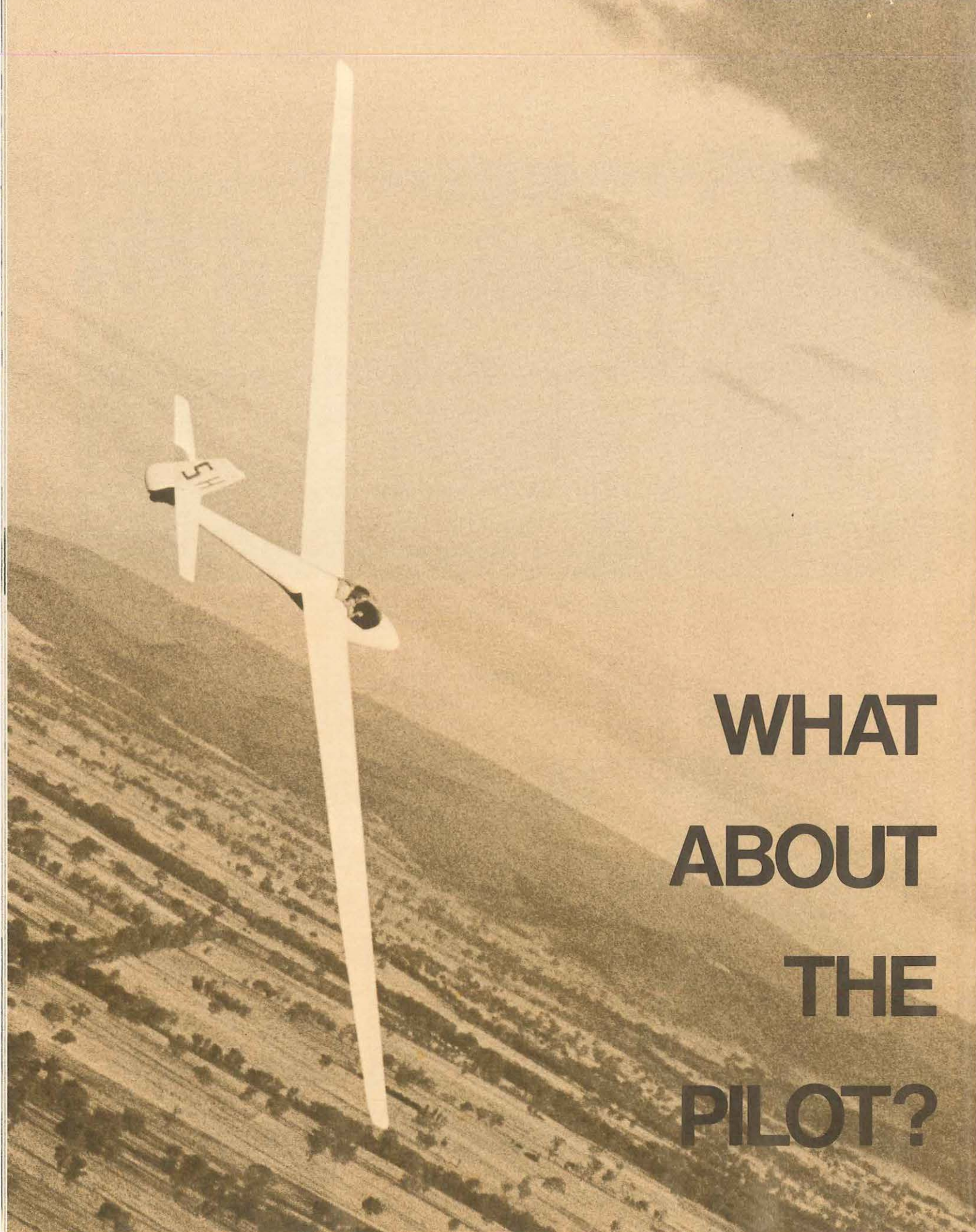


I wish . . .

I'd used . . .

the chocks !

(With thanks to Leigh Graetz of South Australia and apologies to "Life" Magazine.)



WHAT ABOUT THE PILOT?

Even with the best accident prevention measures in the world, in gliding, as in power flying, it is hard to envisage that we will ever reach that ideal situation where no accidents happen. So although we must continue doing our utmost to reduce the possibility of accidents to an absolute minimum, we have to live with the fact that frail flesh and blood will always be exposed, to some degree, to the risk of injury in glider accidents. It isn't much use pretending the risks are not there — this won't make them go away. On the contrary, a realistic appreciation of just what these risks are in gliding, should help to make us even more safety conscious. The article that follows seeks to stimulate just this sort of an appreciation.

IF you prang, you have a good chance of being hurt — badly." So said an experienced member of the gliding fraternity while this special gliding issue of the Digest was being prepared. And of course, he is quite right! Consider these facts of life in the world of gliding:

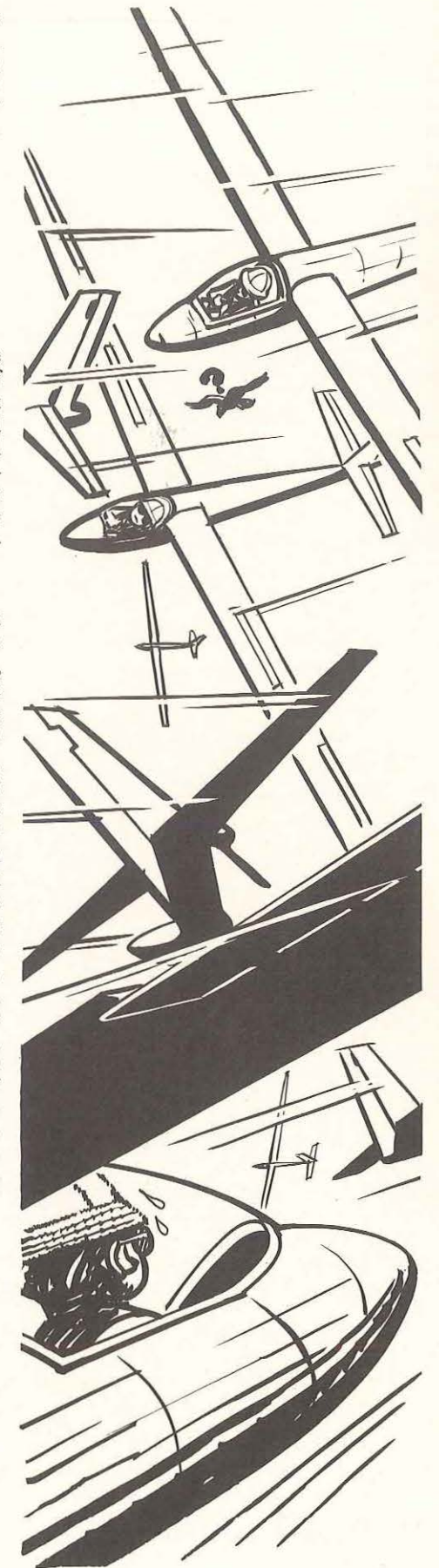
GLIDER DESIGN

Construction : Material used is of fine gauge or section, and the structure is, of necessity, as light as possible consistent with required aerodynamic and ground handling strength. As well, the wood and fibreglass generally used in glider construction is brittle. The overall result is that the structure has comparatively poor energy absorbing characteristics, particularly in the case of wooden gliders.

Shape : Fuselage cross section is kept to a minimum to reduce drag and provide the best Lift-Drag ratio. As a result, there is little room under the pilot's seat for shock absorbing or cushioning material. Modern high performance single-seat sailplanes such as the Kestrel, Libelle and Cirrus, all have a reclining pilot position, with only two to three inches between the underside of the aircraft and the pilot's posterior. If a parachute is worn, it is of the back-pack type so as to contain the pilot within the limited fuselage height. Because of this lack of protection underneath, the pilot's back is particularly vulnerable to injury. This is especially so in non-sprung, non-retractable, undercarriage gliders such as the Boomerang, Kookaburra, Nymph, Cherokee etc, where the pilot's spine is close to the initial point of contact with the ground. In reclining-type sailplanes, the pilot's legs and feet are also very vulnerable — there is virtually no protection in front of them — only the lightweight shell of the nose.

Undercarriage : The single main-wheel undercarriages fitted to most types of gliders, means that the landing wheel is in the centre line of the aircraft — in single-seaters, the same line occupied by the pilot's spinal axis. In most gliders too, the wheel is positioned slightly in front of the aircraft's centre of gravity. This is usually close to the position of the pilot's seat, and the result of these two factors is that any heavy impact taken on the main undercarriage is transmitted directly to the pilot's spine.

* * *



WHAT ABOUT THE PILOT ?

"...could pose quite a serious survival problem."



TYPES OF OPERATION

Launching : Winch, auto-tow and reflex launching methods all place a glider in an extremely vulnerable situation in the event of a power failure or cable break. From the low airspeed, steep nose-up attitude, in which a glider can be placed in this situation, rapid recovery action is necessary to prevent a stall and a very heavy landing. At a greater height, a resulting stall can lead to a spin if an incorrect recovery technique is used. Aero-towing, on the other hand, does not have the same problems, though it is more costly. Rope breaks are unusual, and generally occur before the glider begins to roll. Aero-towing these days with synthetic fibre ropes, is a comparatively gentle operation.

Volume of Aircraft Movements : Glider flying involves many more take-offs and landings on an hourly basis than power flying, because there is some truth in the old saying that "every landing is a forced landing". For this reason, there is a proportionally greater exposure of pilots to near-ground flying. This is manifested in the fact that the number of launches, rather than the number of flying hours, is used as a measure of a pilot's experience.

Many gliding clubs in Australia too, operate from rather inadequate areas — in some cases, gullies or ditches cross the club's paddock. A cable break, or a misjudged landing in these circumstances, can be doubly hazardous.

In-Flight Risks : Good thermals attract gliders like bees around a honey pot. In some cases as many as 15 to 20 gliders could all be working the same thermal. A good thermal will usually provide adequate vertical separation, but when an inversion puts a "lid" on the top of it, the top layer can become a very hazardous slice of airspace, with a high risk of collision.

Cloud flying is not legal in Australia. But as some pilots have learnt, (see page 24) it is quite possible to be drawn up into a large cumulus cloud while thermaling just beneath it, especially in a glider not fitted with powerful speed-limiting air brakes. The pilot is then faced with the very real danger of disorientation, loss of control and exceeding the glider's design limits. In this situation it is not surprising that gliders have broken up in flight. Other dangers inherent in being caught in cloud are that of hypoxia if carried too high by convection, hail, severe turbulence and the risk of a mid-air collision with a powered aircraft operating under Instrument Flight Rules.

Competition Flying : The stress of competing in a major gliding event can easily push a pilot beyond what he would normally regard as safe operational limits. It may tempt him to :

- * Fly the glider beyond its design limits.
- * Prolong the flight past the time when there is enough daylight left for a safe landing in an unfamiliar area.
- * Venture over unsuitable terrain with insufficient height in hand.
- * Delay committing himself to a landing until too low to manoeuvre with safety.

Outlanding Problems: A glider or a sailplane, by its very nature, is often forced to "land-out". In this situation the pilot has to choose the best-looking area that is available within safe gliding distance of his position. But this is usually in a totally strange paddock, with the ever-present danger of concealed rocks, ditches, roots, stumps, and slopes — not to mention powerlines. The single-wire powerlines so favoured by most rural electrification schemes are particularly notorious hazards — their supporting poles are widely separated and

frequently concealed amongst trees, so that it is almost impossible to detect the "run" of the powerline from the air. A pilot can be faced with all these problems close to last light at the end of many hours of flight, during which he might have been flying at high altitudes. Thus, as well as being very tired, he might be suffering from the effects of hypoxia and not seeing too well.

Outlandings too, even if entirely successful from a flying point of view, can be made in sparsely populated areas where communications are few and far between. And with our rural economy as it is today, some farm houses and homesteads are deserted and without a telephone. As well as proving a profound disappointment to an overtired glider pilot, an extreme case could even pose quite a serious survival problem. Most readers will remember the case of the Blanik pilot, making a local soaring flight from Bond Springs in central Australia, who became lost and was forced to land out at last light in a hostile, desert environment. He had no water or survival equipment of any kind, and was in the final stages of dehydration and heat exhaustion when he was finally found — days later.

* * *

Well then, what about the pilot, now that we have looked squarely at some of the facts? Statistics that we haven't yet considered show that, in Australia between 1951 and 1971, a total of 119 glider accidents were reported, involving 151 occupants. Twenty-five of these accidents resulted in serious injuries and 15 in fatal injuries. In the 25 accidents that produced serious injuries, a total of 14 out of 29 occupants involved sustained a fracture of the spine. From these figures it is apparent that if an occupant of a glider does receive serious injuries, there is a fifty percent chance that he will have fractured his spine.

It is also quite plain from the injury patterns that have been observed, that even comparatively minor accidents in gliders can cause back injuries of some type.

For this reason, pilots who are involved in heavy impacts, or even heavy landings in gliders, without apparent injury, but who subsequently experience pains in the back, should seek medical attention without delay. You cannot be too careful when dealing with the possibility of injuries of this sort!

* * *



"...a stall and a very heavy landing."

Gliding is a fine sport which enables many people who would not otherwise have the opportunity, to savour the extreme satisfaction of piloting an aircraft on their own, and of pitting their skill in a unique way against the forces of nature. And provided the regulations and accepted procedures governing the operation of gliders are faithfully observed, the sport can be engaged in with a high degree of safety.

But as with all forms of flying, the penalties for lack of preparation and the taking of undue liberties can be severe indeed. In any type of human activity of

course, there is a constant temptation to take things for granted and to make "short cuts", once a reasonable standard of proficiency has been attained. Experience has well and truly attested to the fact that the old truism "familiarity breeds contempt", is a very insidious foe of safety in the world of aviation.

So without in any way allowing the facts quoted to cast a shadow over their enjoyment of the sport, gliding enthusiasts would do well to regard these statistics as a stimulus to take even more than usual care in all aspects of their operations.

HOW SAFE IS GLIDING?

IT must be admitted that the gliding fraternity is one section of the aviation industry that has not received its full share of coverage in the Aviation Safety Digest in recent years. Certainly, it would have been good to have been able to include much more material on gliding safety than circumstances have allowed. Could this have been done, a greater consciousness of operational safety might have been inculcated in the minds of some who, having chosen to do their flying without the aid of an engine, have run into problems of one kind or another either during their training or in their subsequent operations.

But apart from the fact that the present rather limited safety education resources of the Digest have somehow to try and cater for all facets of the aviation industry in Australia, there is another side to the coin: Except in the case of accidents, where notification to the Department is inevitable (though not always prompt!), comparatively few gliding clubs, and seemingly fewer individual glider pilots, appear to have realised the experience value of reporting operational situations in which safety has been compromised. As a result, both the Gliding Federation and the Department have been "starved" of the very information that could have been drawn upon to improve gliding safety. Also, because of this dearth of operational information, it has been almost impossible to know, apart from the isolated

cases of actual accidents, whether or not undesirable or even dangerous trends are developing in glider flying. It is the sick who need the physician, and unless statistical information of this sort is available, it is simply not possible to embark on any effective safety education programme.

Air Navigation Regulations require any situation in which the safety of an aircraft or its occupants is jeopardised to be notified to the Department in the form of an Air Safety Incident Report, and pilots engaged in power flying regularly make such reports. The purpose of these reports is not that the persons concerned may be disciplined, but that the information contained therein can be used, together with other incident and accident data, to develop safer operational procedures and practices. The situations on which Incident Reports are to be submitted are set out in the Visual Flight Guide and Aeronautical Information Publications but pilots are invited to interpret these instructions in the broadest possible sense and report any situation having a bearing on air safety. Obviously, the number of Incident Reports which the Department receives is very much greater than the number of accidents occurring in any given period and potential accident situations can be anticipated by study and interpretation of unsafe operational trends as revealed by the character of the incident reports being received. In this way, hazards that are shown to exist by actual experience can be avoided in future operations, without having to wait for an accident to demonstrate that a particular operational problem exists. In fact, much of the credit which the Department receives for Australia's fine safety record is due in no small measure to the wealth of air safety information gleaned from its Incident Reporting system.

But in the Australian gliding world at the present time, there is no really effective "life-line" of this sort. As a result, it is virtually impossible to recognise the symptoms of any dangerous or undesirable operational trends — at least not until it is already too late and a number of accidents have occurred! Nowhere is this more so than in the field of glider flying training.

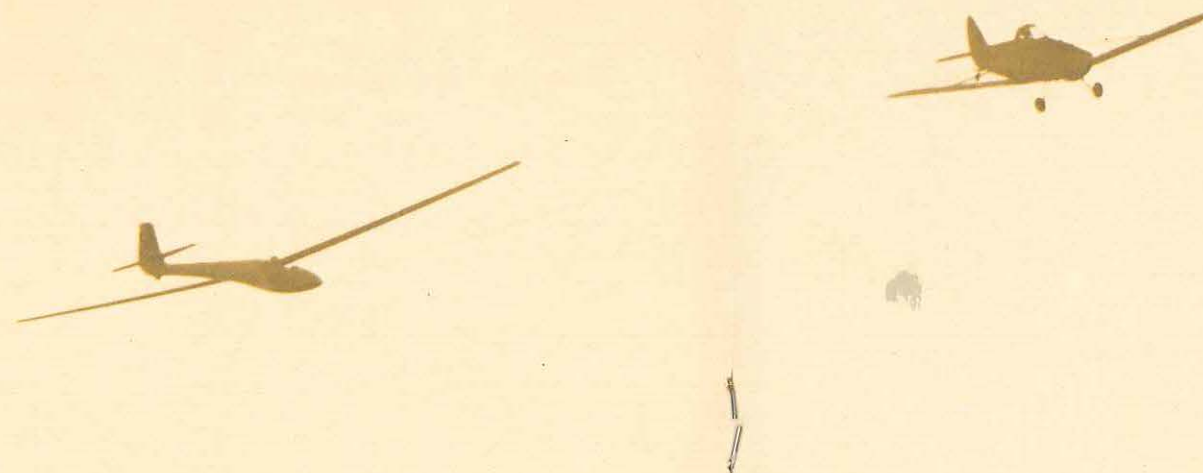
For example, no training system, however well devised it may be, is perfect, and several similar incidents could well occur in different clubs

over a period of time. To the instructional staff of any one club, with little or no knowledge of what is happening in other clubs, there has been only one, apparently isolated, incident. But in actual fact the training system as a whole has experienced a number of incidents of the same type which, taken together, indicate that there is a basic weakness in the training system as it is being practised. The weakness might have resulted from any one of a number of factors. For example, there could be a serious deficiency in the procedures laid down by the Federation or the particular clubs. Or the standard of instructional supervision might be inadequate at Federation level, State Committee level, or club level. Again, new factors might have been introduced to the training system for which provision had not been made in the procedures being used.

Glider pilots who are active in their clubs will see for themselves that some of the accidents reviewed in this issue of the Digest were the outcome of a developing incident pattern that went unnoticed until too late. These accidents demonstrate very well that an incident trend if not recognised and remedied, ultimately results in an accident. It follows that any imperfections or weaknesses existing in an operational training system can be assessed from a study of incident trends.

A realistic assessment of this sort can be made, and the measure of in-built safety and efficiency in existing procedures determined, only if the number and nature of incidents, as well as accidents, are known. It is for this reason that both gliding clubs and individual glider pilots are now urged, in their own interests, to follow the example of their power-flying colleagues and recognise the fact that accidents do not merely come "out of the blue", but are nearly always the culmination of a chain of events or incidents which, had it been "broken" early enough by the necessary remedial action, could have prevented the accident. It is hoped that a study of the experiences reviewed in this issue will carry its own conviction of the need for intelligent reporting of any unacceptable aspect of gliding safety.

The overall safety record of gliding in Australia is a good one. Let us strive to make it even better!



THE PRICE OF KNOWING BETTER

While attempting an instrument approach to land at New Haven Connecticut, U.S.A., a turbine-engined Convair 440 crashed and was destroyed by fire. Only three of the thirty-one occupants, including the first officer, survived.

THE aircraft was operating a scheduled passenger service from Washington, D.C. to Newport, Virginia, with en route stops at Groton and New Haven, Connecticut, and Philadelphia, Pennsylvania. Because of fog in the Groton and New Haven areas, the flight's normal "despatch release" had been amended so as to enable it to proceed IFR from Washington to Philadelphia, via Groton and New Haven, without the necessity to refuel at Groton as was customary. To permit this change in plan, additional fuel was taken on before departing from Washington.

The aircraft set heading from Washington at 0714 hours as planned, but only five minutes later elected to cancel its IFR flight plan and continue direct to New London VFR. When the aircraft arrived over New London 54 minutes later, fog had reduced weather conditions at the airport to below the minima prescribed for a VOR approach, and the crew advised that they would hold "VFR on top" while awaiting an improvement in the weather.

At 0841 hours, after holding for half an hour, the aircraft made the first of three abortive IFR approaches to land at Groton. But each time, even after deliberately descending well below the minimum descent altitude of 510 feet AMSL, the captain was forced to execute a missed approach. The first two approaches were broken off only when the aircraft had descended to 175 feet AMSL and the third, flown with even greater determination, was not discontinued until the aircraft had descended to 125 feet. The fourth approach to land was successful and the aircraft finally arrived at the Groton passenger terminal at 0921 hours, nearly an hour behind schedule.

While the aircraft was on the ground, the captain was asked by the company's agent if he required fuel. After making some calculations on the fuel needed to continue to Philadelphia and commenting to the first officer that they would have

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enough if they didn't "run into any delays", the captain advised the agent that they had sufficient, mentioning a figure of 6,000 pounds. The aircraft subsequently taxied for departure at 0933 hours and reported setting heading for New Haven at 0936 hours.

At 0944 hours, the aircraft was cleared to descend from its cruising altitude of 4,000 feet and the New Haven weather was passed to the crew. The weather was reported as "sky partially obscured, visibility a mile and three quarters in fog, wind 180 degrees at five knots." New Haven Tower then offered the aircraft the choice of runway 02 or 20, advising that the wind was now from 190 degrees at five knots. The aircraft nominated runway 02 and was cleared to land.

Making a straight in approach, the crew completed their final check list and the captain called for 40 degrees of flap. The cockpit voice recorder subsequently showed that as the aircraft continued inbound on its final approach, the first officer called "500 feet", "top minimums" and "decision height". Then, seeing that they had descended through the prescribed minimum descent altitude of 380 feet, the first officer announced that they had an airspeed of 105 knots with a sink rate of 500 feet per minute. The captain replied "All right", telling the first officer to "Keep a real sharp eye out there". Eighteen seconds later, the first officer, obviously concerned, remarked "This is - low" and then, "You can't see down through this stuff". The captain replied that he could see the water "straight down". The first officer then sighted the water too, exclaiming that they were "not 20 feet off it!". Two and a half seconds later, the first officer called out "Hold it", as a building appeared out of the fog in front of the aircraft. Impact followed almost immediately.

* * *

New Haven airport is close to the northern shore of Long Island Sound and has an elevation of only 14 feet AMSL. The final approach path to runway 02 lies over Long Island Sound itself and the shoreline, with the runway threshold 4,000 feet north of the beach. The airport is served by a VOR located near the centre of the airport and, for a straight in IFR approach to runway 02, the minimum descent altitude is 380 feet. The minimum visibility required is one mile.

The aircraft had struck three adjoining houses fronting the beach, some 500 feet to the right of the runway centre line. The fuselage had come to rest 270 feet beyond the initial impact point, and apart from the cockpit area, had remained substantially intact until destroyed by the fierce fire which followed the crash. A detailed examination of the wreckage produced no evidence that the aircraft was other than fully serviceable at the time of the accident.

Both members of the crew were properly qualified for the flight they were undertaking. The captain had over 12,000 hours, nearly 4,000 hours of which had been flown in Convair aircraft of the type involved in the accident. His ability had been consistently rated as satisfactory by check pilots, and he had no history of physical or emotional illness. The surviving first officer said that the captain had seemed perfectly normal during the flight on which the accident had occurred. He also mentioned that the captain was an excellent pilot and that he liked flying with him.

* * *

It is clearly evident that the accident resulted from the captain's decision to continue his approach to land at New Haven, to a dangerously low height. Yet his attitude to the conduct of this approach seems to have been little different from that demonstrated during the three extremely low but unsuccessful approaches he made at Groton. For this

reason, any consideration of the factors leading to the accident at New Haven, must also take into account the circumstances that prompted the captain to depart from acceptable standards of airmanship earlier in the flight.

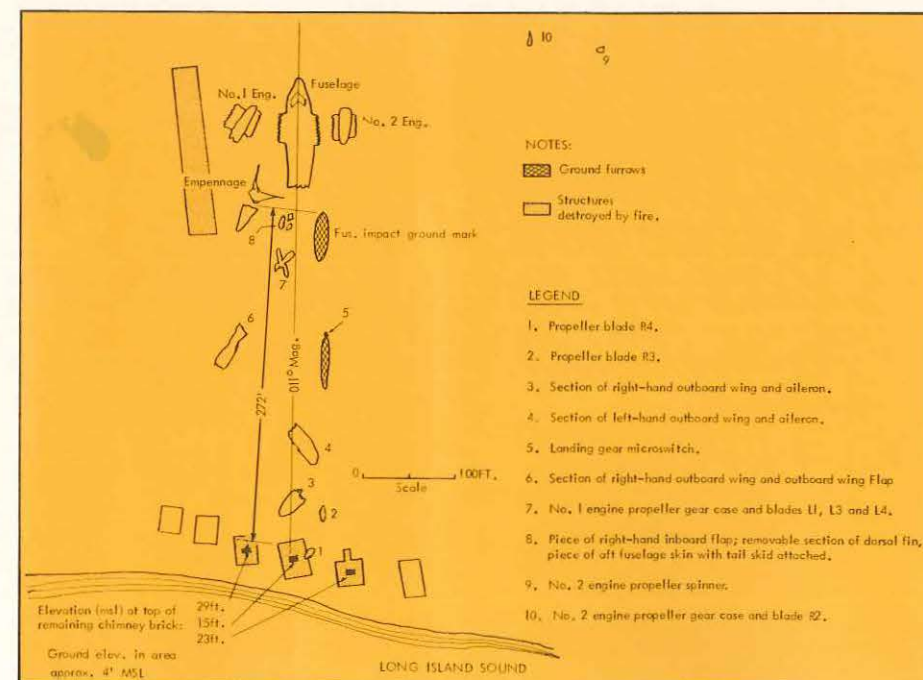
It seems quite clear from the way in which the captain conducted the flight up to the time of the accident, that the aircraft's fuel requirements were of primary concern to him and were occupying much of his attention. Once having amended his flight plan to eliminate the need for refuelling at Groton, the captain evidently determined that he would conduct the flight with the least possible delay in order to have the maximum possible fuel at his destination in case holding became necessary.

When the aircraft left the terminal at Washington it was given a clearance to taxi to runway 15. But, as time could be saved by using runway 03, which is closer to the terminal, and more nearly aligned with the route to be flown after take-off, the crew requested, and were approved, to use this runway. Similarly, several minutes after take-off, when the departure controller instructed the aircraft to execute a 360 degree turn, the captain elected to cancel his IFR clearance rather than make the turn. He later refused the air traffic controller's offer to retain the IFR clearance even though the turn was no longer required. The captain obviously saw that if he proceeded VFR via the most direct route, additional time could be saved.

The scheduled flight time from Washington to Groton was one hour 15 minutes but, on this particular trip, the aircraft arrived over Groton only 59 minutes after departing from Washington. Had the weather conditions at Groton been suitable for a landing the flight would have arrived at the terminal 10 minutes ahead of schedule. As a result of this saving the aircraft was able to hold over Groton for a time without the need for operational considerations or decisions.

Top: Aerial view of New Haven Airport, showing the approach path to runway 02. The aircraft struck the homes fronting the beach in the lower right of the picture.

Bottom: Diagram showing direction of impact and wreckage trail.



The aircraft's first approach to Groton was begun about 30 minutes after its arrival over the Groton VOR. But by this time the flight was 20 minutes behind schedule and about a third of the available holding fuel had been consumed. While holding, the crew had seen the fog over the airport and the captain knew that, on reaching the 510 foot minimum descent altitude in these conditions, the runway would not be visible. Rather, if his landing attempt was to be successful it would be necessary to descend to 200 feet within a mile of the runway. The captain was thoroughly familiar with the area and, mindful of his fuel and schedule requirements, he decided to make such an attempt to land, apparently believing that sufficient visibility would be available to do so. Although such an approach was not authorised, the captain evidently believed he could conduct it safely.

During the first attempt to land, the captain did not acquire sufficient forward visibility and a missed approach was executed. A second attempt, following the same type of approach was unsuccessful for the same reason. On his third attempt the captain's increasing concern to effect a landing manifested itself in his aggressiveness and determination in continuing down to an altitude of only 125 feet before initiating a missed approach. The aircraft then circled the airport for a further 10 minutes before the fog cleared sufficiently to permit a landing. A landing was finally accomplished an hour and eight minutes after the aircraft had arrived over the airport.

Although the captain said that he had 6,000 lbs. of fuel on board when asked at Groton if he intended to refuel, the aircraft's actual fuel at that stage was a little less than 5,800 lbs. The shortage was small and of no significance as far as the next leg to New Haven was concerned, but it is possible that the captain's decision to continue with less than the reserves required for the following leg to

THE PRICE OF KNOWING BETTER

Philadelphia, influenced his conduct of the leg to New Haven. When he took off from Groton, the reported weather at New Haven was apparently of no great concern to him, but fuel and time were probably still occupying much of his attention. If for instance the flight encountered no ATC delays at New Haven and could make a straight in approach to runway 02 several minutes, involving several hundred pounds of fuel, could be saved. And, if even 200 pounds of fuel could be saved in this way, the actual fuel remaining at New Haven would be very close to the legal requirements for the next leg to Philadelphia. Thus, in his attitude to the conduct of the approach at New Haven, it seems that the captain adopted the same philosophy as he had with the Groton approaches. Indeed, the captain probably considered the New Haven approach less difficult than the one at Groton because of the lower surrounding terrain.

The investigation established that the captain elected to land on runway 02 with a five knot tailwind component, despite the fact that this action was contrary to his company regulations which prohibit any downwind landings at New Haven. The captain was aware of the tailwind component, so it is reasonable to believe he had a compelling reason for selecting runway 02 rather than circling to land on runway 20. It is very likely that the reason was his desire to save fuel so that refuelling at New Haven would not be necessary.

It is quite clear that the first officer performed his duties throughout the flight in accordance with company procedures, and to the best of his ability. It is obvious that, after the flight had descended below the minimum descent altitude, he had attempted in several ways to alert the captain to growing danger resulting from the continued descent. It is perhaps difficult to understand why the captain continued the descent in the face of the first officer's repeated warnings,

but it may be significant that both pilots acquired visual contact with the water directly below them not long before impact. This contact could have distracted the captain to the point that he did not realise the aircraft was still descending. The fog layer lying over the area at the time extended from the surface to about 400 feet AMSL, but both the ceiling and visibility were considerably less over the water than the airport. The horizontal visibility in the fog was restricted to less than 50 feet over the water and to between 150 to 200 feet over the beach area. The aircraft had descended into the top of the fog at about 400 feet AMSL but the crew did not acquire any visual contact with the water until they descended below 100 feet AMSL. There was nothing to indicate that the crew had any forward or horizontal visibility. This is corroborated by the fact that the first officer sighted the houses in the aircraft's flight path only about a second before impact.



PROBABLE CAUSE : The National Transportation Safety Board determined that the probable cause of this accident was the captain's intentional descent below the prescribed minimum descent altitude under adverse weather conditions without adequate forward visibility or the crew's sighting of the runway environment. The captain disregarded advisories from his first officer that minimum descent altitude had been reached and that the aeroplane was continuing to descend at a normal descent rate and airspeed. The Board was unable to determine what motivated the captain to disregard prescribed operating procedures and altitude restrictions and finds it difficult to reconcile the actions he exhibited during the conduct of this flight.

COMMENT : The relevance of this accident to Australian operations is hard to assess, but on the "law of averages" there may well be some pilots in Australia who feel tempted to "bend the rules" at times. Certainly in the case of some light aircraft accidents in Instrument Meteorological Conditions, evidence has come to light of instrument rated pilots conducting operations which were not in accord with "the book". It is for any other such pilots that this overseas accident should have a convincing safety message. —→

A MOUTH FULL OF RED DIRT

The author of this issue's Pilot Contribution was taking part in a competition cross country flight on the final day of State Gliding Championships. The weather was fine and mild with only weak thermal activity. Before departing he had attended a pre-flight briefing at which the weather forecast for the flight was discussed, and at 1200 hours his aircraft was aerotowed to 2,000 feet where he released. He continues the sad story himself:

WITHOUT delay I joined a thermal already occupied by an M200 and Blanik and together with a KA6 which joined later, we all thermalled to 3,000 feet which, owing to drift, positioned us about half a mile south-east of the aerodrome.

Max Howland in the M200 was the first to leave with the KA6 in close pursuit; the Blanik moving off a little later. I decided to maintain my relatively secure position until I saw how my companions made out.

Good! Max had found lift, a little to the west so I headed off, crossing the starting line at 1230 hours at 2,800 feet. I joined the thermal about 500 feet below Max, worked it to 3,200 feet and left it about three minutes behind him. Max Howland is one of Australia's best soaring pilots, so I decided to stick with him as far as possible.

Another two miles and Max had found another thermal. Again I attempted to follow suit, but he must have sensed my intention, for he left it before I had time to join him. After searching for a little, I found the thermal's centre and to my delight discovered that I had a good 200 feet per minute climb which carried me to 4,000 feet. This gave me a definite advantage over the others.

Two miles from the first turning point found me level with Max Howland's M200, which was thermalling about 1,000 feet below me and a quarter of a mile east of track. Should I use this lift or carry on around the turning point and pick it up on the way back? I was at 3,000 feet — plenty to round the turning point and get back to Max's thermal. It was clearly marked as it was originating from quite a

large fire. Another advantage was that I would be spending time in the thermal on the downwind run. Off-setting these advantages however, was the chance that the thermal might not be what I hoped and, in this case, 1,500 feet wouldn't give me much time to find another. I decided to go on, and rounded the turning point at 1330 hours. This put me in the lead. I struck a little lift at the turning point, but after trying a few turns, decided it wasn't worth bothering about.

Back now around the fire, I searched for lift in vain, flew through the smoke, tried every trick I knew, but still I went down. Now I was at seven hundred feet — I decided to give it away and set up a circuit for landing. But all wasn't lost yet, for just then I smelt smoke. I threw the "BG" into a turn — sure enough up comes the variometer to the neutral position. Get the speed back — only one foot a second! Come on, come on — find it! Thump — she had found it! Another thump, and she had lost it just as quickly, dropping her wing to show her protest. I curse as I bring the machine around towards the thermal again. Thump again! I tighten the turn, lower a notch of flap, tighter still, and a bit more speed. Good on you, you've got it! But we only manage two turns and fall out again. You ***!

This went on for the next quarter of an hour. By then I had squeezed all I could out of it. It was time to move on — I was down to 1,000 feet again. I try a little further to the east and find some lift there. I manage to maintain 700-1,000 feet, but am drifting downwind towards some hills. I tell myself to give it away — you could be having tea and scones at that farmhouse if you land in that

paddock over there. But I carry on, up to 1,000 feet again, then down to 700. I sight a large, sunny contour field on the side of a hill — maybe I'll find better lift there. Flying around the field, it seems reasonable for a landing. And there's no lift. Do I give up or carry on over the hills and try my luck there? That side of the range is a bit too far for a retrieve on the last day of the championships so I decide to give up.

At 350 feet, I enter the downwind leg, check my harness and turn left on to base. Suddenly I hit lift under my port wing. Almost without thinking I pull the machine into a steep climbing turn to wash off excessive airspeed. The lift was good but then I was out of it again, the "BG" giving its customary wing drop. Recovering quickly, and a little apprehensive, I maintain the turn and check the airspeed. Forty miles per hour. Too slow — get the nose down! Full flap and I grope for the spoiler lever — got it now, full spoiler. That's it, now I'm heading in the same direction as my original base leg and maintaining the turn. I'm 40 feet up with another 45 degrees to turn before I'm lined up on final.

But suddenly the nose drops sharply. Good grief, the ground's coming straight up at me! This is it! Will it kill me? How clearly defined the ground is! Bang! Crash! ... I see the canopy hitting the ground in front of me ...

* * *

... I don't feel any different except for the red dirt filling my mouth and eyes. But I'm frightened to move ... I look at my arms and tug them out. I feel my legs and find they still have feeling ... I decide I'm not hurt after all! The time is 1430 hours.

I don't know if I undid the harness or not — the straps were in very good condition. I had no pain or later bruising that indicated I had been thrown forward to any great extent. Not long after the crash a farmer drove up the road on his tractor and was greatly surprised to see me on my feet. He took me to his home and I rang the aerodrome. I suffered only minor shock.

I believe the accident happened because I:—

- * Attempted to pick up a thermal when committed for a landing.
- * Tried to thermal too slowly close to the ground and thereby allowed the machine to stall when it fell out of it.
- * Had insufficient respect for an aircraft which I knew had certain vices particularly when dropping out of a thermal.
- * Was disorientated in the pitching plane during the later part of the last turn which was made through fairly steeply rising ground.
- * Was apprehensive during the last few seconds of flight, which would have tended to make me lose the "feel" of the aircraft.

Needless to say the accident was entirely my fault for which I feel most disgusted at myself. But I hope what I have written might convey the challenge, trials, frustrations and great absorption of mental energy which I'm sure every glider pilot experiences whilst competing under such conditions. Finally I hope it will stress the importance of knowing **when** to give up and land, despite the disappointment!

Comment : There is no doubt that the accident was the result of the pilot's

departure from accepted outlanding procedures, as he himself points out.

The pilot had already reached a point on base leg from which a safe outlanding could have been effected and when he found lift he was at a height of only about 300 feet. As all glider pilots know very well, G.F.A. procedures require that, once having committed himself to landing, a pilot should ignore any further lift he might encounter and continue with his approach. But in this instance, the pilot disregarded the established procedure and attempted to work the lift. Doubtless his judgement was coloured because he was competing in a major gliding event and was leading at that stage. However, as indicated by the fact that the pilot was unable to centre and remain in the thermal, the area of lift he encountered was of insufficient width to contain his radius of turn.

A glider working a thermal at a steep angle of bank and at low airspeed, can stall very quickly if it passes out of the lift into a surrounding area of sink. It is apparent that this is what happened on this occasion and the pilot, recognising the onset of a spin, effected a recovery with a minimum loss of height. But with little or no time to consider the glider's flight path during this recovery, the pilot found himself apparently overshooting his original aiming point and he immediately extended the flap and spoilers. Although the pilot had recovered control, it is clear that the glider had not regained sufficient speed to permit the extension of full flap and spoilers with any margin of safety. As a result, the glider lost what flying speed it had, stalled, and nose dived into the ground from about 40 feet.

It seems that the pilot's decision to

extend full flap and spoilers at this stage was based solely on the aircraft's apparent nose-down attitude. The pilot realised afterwards that he was misled by the upward slope of the field into which he was approaching, with the result that he thought the aircraft was in a much steeper nose-down attitude than was actually so.

There is one other important lesson to be learnt from this story. It very much concerns the fact that the pilot was able to tell the story at all.

Some readers may recall an earlier, serious outlanding accident, that was reviewed in detail in Aviation Safety Digest No. 62. In this instance also, the glider, a Vogt L0150, stalled at low altitude and dived into the ground. The unfortunate pilot was killed, in all probability for the simple reason that his harness failed when the impact occurred. Tests made on the harness after the accident revealed that not only was it of a non-approved type, but also that it had been subjected to an unauthorised repair in the past and altogether was well under the minimum strength specified by the Department.

As the damage sustained by the gliders in each of these cases was very much the same, it is difficult not to conclude that the vast difference in the outcome of the two accidents can be attributed almost entirely to the fact that our contributor's harness was a sound one. As the article on page 10 shows, gliders by their very nature afford little enough protection to their occupants. The least that glider pilots can do is to ensure that their harness gives them the best possible chance of survival in the event of an accident. —————>

A
MOUTH
FULL
OF
RED
DIRT

ENCOUNTER WITH A THUNDERSTORM

SHORTLY before 1300 hours, after a busy morning's gliding at Camden aerodrome, a well-developed thunderstorm was seen approaching from the south-west.

So as to "hangar fly" his club's Schleicher AS-W15, and facilitate its return to the hangar before the storm broke, an experienced glider pilot was aerotowed to 2,000 feet, intending to make use of the lift being induced by the proximity of the storm, until its impending approach dictated that he return and land.

The glider pilot released from the tug aircraft to the south of the town and immediately encountered good lift and, as the base of the overlying cloud was well over 4,000 feet, he decided to make use of this lift. By the time he had climbed to 3,800 feet, he found that his view of the aerodrome was obscured by cloud, but as he could see Campbelltown, seven miles away to the east, still in sunshine, he decided to fly in that direction.

After flying east for about four miles, he made a 180 degree turn to check what the visibility was now like in the vicinity of Camden aerodrome. From 3,500 feet he saw that although the aerodrome itself was still obscured by cloud, most of the town was clearly visible and the pilot thought he would be able to get back to the aerodrome by descending towards the town and then diving beneath the cloud layer.

As he approached Camden, he recognised the need to lose height more quickly, so he lowered the glider's undercarriage and opened the dive-brakes. But as he neared the overlying cloud the pilot found himself completely enveloped with his visibility reduced to zero. The glider, instead of continuing to lose height, suddenly began to ascend. Very soon afterwards the rate of ascent increased frighteningly to over 2,000 feet per minute and the glider ran into heavy rain.

* * *

The pilot of the Schleicher can be considered extremely fortunate on several counts:

- * That he did not lose control of the glider in the cloud and turbulence.
- * That his aircraft was not damaged, either by gust loading or hail, while flying in the storm.
- * That he was not carried to a height where he could have been affected by hypoxia.
- * That he did not collide with obstructing terrain while still in cloud, as could possibly have happened if he had flown a little further to the south of where he actually did.
- * That he broke out of cloud before overflying the coast, which was only about three miles from where he finally landed.

* That, when he did break out of cloud at such a low altitude above ground level, there happened to be an area open enough for a safe landing within gliding distance of his position. Most of the surrounding area is rocky and heavily timbered.

Altogether, the occurrence underlines how extremely hazardous it is to "push one's luck" in the vicinity of a thunderstorm, despite the exciting amount of lift that is likely to be found there. In this instance, the pilot was highly experienced in gliding and clearly possessed above average flying ability. But what would have happened if the glider was being flown by someone of lesser skill and experience?

\$ EXPENSIVE OUTLANDING \$

THE pilot of this Slingsby Skylark was on the last leg of a competition cross-country flight, originating and returning to Massey Field, Warwick, Queensland. About 15 miles short of his destination, while soaring at 4,000 feet the pilot encountered overcast cloud and began losing height. When he had descended to about 2,000 feet, he began looking for a suitable paddock in which to make an outlanding.



From 1,500 feet, he selected a ploughed field which he considered suitable and well situated. The field was rectangular in shape, with its longer side of about 1,200 feet aligned north-south. The pilot circled the field twice, losing about 500 feet as he did so, and noticed that there was a powerline, also aligned north-south, passing through the middle of the field.

Judging the wind to be a light north-easterly, he decided he would land into the north on the western side of the powerline.

Entering his final circuit, the pilot descended to 700 feet at the southern end of the downwind leg and turned base. On the final approach the pilot had to clear 60 foot high trees on rising ground immediately outside the

southern boundary of the field, and crossed the threshold at 150 feet at an indicated 55 knots. At this stage he noticed the effect of the crosswind he had expected from the right, so he lowered the starboard wing to counteract the drift and touched down flying parallel with the furrows, 700 feet into the field.

But after touching down initially, the starboard wing tip dug into the ground, slewing the glider sharply to starboard. As the glider swung, its tail skid caught in the ploughed furrow along which the glider had landed. The glider still had some speed, and the side load imposed by the swing snapped the fuselage in two, immediately aft of the rear cockpit bulkhead. The pilot was unhurt.

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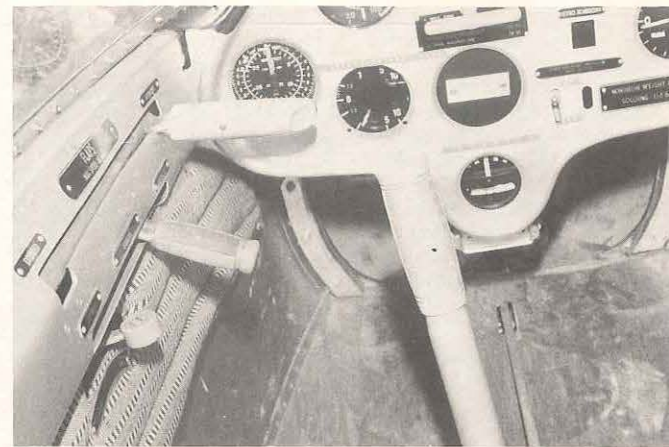
It was evident from the subsequent investigation that the field which the pilot had chosen was the most suitable in the area, despite the presence of the powerline and the trees at the approach end. The wind direction which the pilot had estimated was close to the actual surface wind direction, and the direction he had chosen for the landing was the most suitable in the circumstances. The ploughed surface of the field, though loose, consisted of hard lumps of soil and what furrows there were would certainly have restricted the sideways movement of a glider's tailskid as occurred on this occasion.

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The only other aspect of the accident that remained to be considered, was whether it was reasonable in the circumstances for the pilot to have misjudged the control of his aircraft during the landing run to the extent that the starboard wing tip dug into the ground. However, because of the Skylark's high aspect ratio wing, as with all high performance sailplanes, only about five degrees of bank would have been required for this to happen. Hence, with the pilot attempting to counteract drift from the right during the landing, and the landing itself taking place on the rough surface of the ploughed paddock, the starboard wing's contact with the ground was quite understandable.

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It is of course a fact that some glider pilots show a preference for ploughed paddocks when choosing a field for an outlanding in unfamiliar terrain. They make this choice because of the better opportunity this often affords to see obstructions such as powerlines on the approach, and other possible hazards such as stumps and holes in the ground itself. But even this precaution is by no means infallible and it seems clear that any possible advantages which ploughed paddocks might seem to offer, need to be offset against the risk of damage to the glider which might occur, as in this case, as a result of landing amongst furrows.



The WRONG HANDLE!

It could have been so MUCH WORSE

AFTER being aero-towed to 2,000 feet from Byford aerodrome, Western Australia, the pilot of a Blanik L13 released from the tug aircraft and commenced thermalling. After about a quarter of an hour's flight, during which the glider attained a maximum height of 2,300 feet, the pilot returned over the aerodrome to enter a right hand circuit pattern for a landing.

Joining the downwind leg at 850 feet, the pilot saw that he was well positioned for a normal approach and landing, and carried out the pre-landing cockpit checks. When the Blanik had descended to 750 feet, the pilot lowered what he thought was full flap and began a turn to the right on to base leg. During this turn, the pilot saw that the glider was now sinking rapidly so he cut short his base leg, turning early towards the threshold of the strip. The glider continued to descend steeply however, with very low ground speed, grossly undershooting the pilot's original aiming point.

While still turning to line up with the strip, the Blanik descended into a set of powerlines bordering the aerodrome boundary 1,500 feet short of the threshold. The glider struck the powerlines with its raised port wing, severing one wire, and slewed violently to the left. The starboard wing tip struck the ground and the aircraft cartwheeled, falling to the ground in a flat attitude. It finally came to rest, still entangled in the severed powerline, facing back in the direction of flight. The pilot was unhurt, but seeing the live wire still entwined around his aircraft, he wisely remained seated in the cockpit to await assistance.

The accident was seen by the chief flying instructor who had been supervising operations at the strip and had been watching the Blanik's circuit and approach to land. He ran to the scene immediately the glider came to rest. Seeing the wire draped across the cockpit canopy, he called to the pilot to keep still. Then taking up a dry branch of a tree, he removed the wire from the aircraft, opened the canopy and assisted the pilot out.

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When the damaged glider was inspected, it was found that the flap lever was still in its "up" detent, but the dive brakes, though only slightly extended with the glider at rest, were unlocked and free to move.

Several eye witnesses, including the chief flying instructor, had seen the glider join the circuit at a position which seemed satisfactory in the existing conditions. At least one witness noticed that when the glider was abeam the pilot's planned touchdown point, the dive brakes extended and the glider began to descend rapidly. It was evident to watchers on the ground that when the pilot realised his rate of descent had increased, he modified his circuit

for a shorter base leg.

Although the pilot turned on to final approach at about the right position in the circuit pattern, the glider was obviously very low at this stage and it was clear that it would strike the high tension wires.

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The eye witness evidence that the air brakes were fully extended just before the glider turned base, together with the pilot's statement that he had lowered full flap just before turning base and the fact that the dive brakes were unlocked when the glider came to rest, strongly suggests that the pilot misidentified the controls on the port side of the cockpit and extended the dive brakes in the mistaken belief that he was lowering full flap. It is also evident that although the pilot appreciated that the glider's rate of descent had greatly increased, he did not immediately react to the likely cause for this condition, nor did he check to ensure that it was in fact the flaps he had lowered.

The pilot was 60 years of age and had been a service pilot and flying instructor during the war years. After the war he had held a commercial pilot licence for 15 years and later a private licence which had expired two years before the accident. His total hours on powered aircraft were in excess of 3,000. He had taken up gliding only a matter of weeks before the accident and in this time he had accumulated a little over 12 hours. He was regarded by his gliding instructor as a competent glider pilot.

The misidentification of the dive brakes for the flaps is an easily-made error in Blanik gliders, and has in fact occurred on a number of occasions, but there is no reason why this should have led to an accident if the pilot had recognised his mistake from the glider's sharply increased rate of descent. It seems likely however, that the pilot's reaction time was such that, when the unexpectedly high rate of sink occurred, he did not instinctively return the control he was operating to the closed or retracted position to reduce the rate of sink. Instead he persisted with his approach to land, even though it should have been obvious that the glider could not reach the intended landing area.

The accident indicates the need for gliding instructors to instil into students the importance of positively identifying, both visually and physically, the correct control for flaps, dive brakes, trim, and undercarriage, so that this identification becomes habit and part of vital action drills. The brief span of time necessary to positively identify a control need not be a distraction to a pilot, and correctly carried out, can be the means of ensuring that accidents of this type are avoided.

GRUNAU GLIDER DAMAGED ON FIRST SOLO

A glider pilot whose experience had been gained mainly on two-seater Kookaburra gliders had been assessed as suitable for conversion on to the lighter single-seat Grunau GB-2.

On the morning of the proposed conversion, the pilot made one flight in a Kookaburra glider and a gliding instructor then briefed him on the handling characteristics of the Grunau and told him how he would like him to fly the circuit. The briefing took about 20 minutes and covered all the likely situations which the instructor thought the pilot might encounter. He particularly stressed the difference in flight attitudes and elevator control response between the Kookaburra and the Grunau, and drew the pilot's attention to the fact that the stalling speed of this type was 28 knots. He also made reference to the greater sensitivity of the Grunau's elevator controls.

The Grunau was then wheeled into position for a winch launch and the pilot took his place in the cockpit. Pre-take-off checks were completed and when all was ready, the command was given for take up slack and then for full power. As the glider began to roll, the pilot held the stick forward in the normal manner to keep the glider running on its landing wheel until flying speed had been attained. He then centralised the controls and the aircraft became airborne. But only a few moments afterwards, the aerodynamic noise seemed to decrease and the pilot glanced at the airspeed indicator. The airspeed was falling off. Suspecting a power failure in the winch, he instinctively adopted the procedure applicable to a Kookaburra in this situation and pushed the stick forward. But

instead of adopting a level attitude as the pilot expected, the Grunau dived heavily into the ground. The pilot immediately released the winch cable but the glider slid for more than 100 feet before coming to rest. The nose of the glider was torn and buckled and the nose skid was broken off. The pilot was apparently unhurt but two days after the accident experienced pains in his back and neck.

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The subsequent investigation established that there had been no failure of the winch, and it



contributed to the force of impact.

Consideration was also given to the possibility that the club's procedure in laying the cable along one side of the strip, so as to keep it well away from landing aircraft, could have contributed to the accident. Laid in this way, the cable has a considerable bow in it when the launch commences, which is taken up as the launch proceeds. In the case of Kookaburra launches, because of the weight of the aircraft, this bow poses no problem, as the resulting slack in

were not aware of the phenomenon, not having experienced it themselves. The briefing which the glider pilot was given before his first flight in the Grunau did not mention the need to be alert for a spurious winch power failure on lift-off, and it seems possible that if the glider pilot had been forewarned, his reaction to the apparent winch power failure might have been less violent.

The question could also be posed as to whether the pre-flight briefing, particularly in relation to the glider's apparent attitude, was adequate. However in the case of single-seat aircraft, demonstrations of this sort can only be given with the aircraft on the ground and this has obvious limitations. The cause of the accident can only be ascribed to the fact that the pilot misjudged the recovery technique required when dealing with a suspected winch power failure.

As a result of this accident all members of the club concerned were made aware of the possibility of obtaining a spurious power failure indication during the initial stages of a winch launch in a Grunau glider.

A ONE TRACK MIND

THE pilot of the Skylark glider shown in the picture on this page, was attempting a five-hour soaring flight in the vicinity of the gliding field, to meet the duration qualification for his "Silver C" Certificate. When he was winch-launched from the field soon after 1000 hours, a hot and gusty north-westerly wind was blowing at about 15 knots. But shortly afterwards the wind strengthened to about 25-30 knots from the same direction.

A dual control Bocian glider, with an instructor and student on board, had also been winch-launched not long before the Skylark, and two other instructors on the ground at the launching point saw that both aircraft were drifting downwind from the airfield under the influence of the strong north-westerly stream. Soon after-



wards, they saw that the Bocian had managed to return to the vicinity of the field with about 1,000 feet in hand, but the Skylark though it was reasonably high, was now so far downwind that the instructors thought it would have difficulty making it back to the field.

They next saw the Skylark heading back directly towards the field, descending quite rapidly as it did so. At one stage, the glider broke off its approach and made a 360 degree turn as though attempting to thermal, but instead of gaining height, the Skylark had obviously encountered an area of sink, for it lost more height before it could complete the turn. Certain now that the glider could not make the field, the instructors saw it resume its straight-in approach, getting lower and lower as it neared the downwind boundary where there was a line of gum trees about 30 feet high.

But not until the glider had descended to tree top height, only a short distance from the line of trees, did it divert from its direct approach to land. At this point, the glider suddenly entered a steep turn to the left. Realising the glider would come to earth on the other side of the trees, the instructors started out towards the scene. Just then, as the glider turned crosswind in the strong, gusty conditions, its already steep angle of bank increased, and the aircraft disappeared from view below a rise in the ground where the line of trees was situated.

When the instructors reached the site, they found the glider had come to rest with its back broken and nose section badly damaged. The pilot who had escaped unhurt, was already out of the cockpit.

* * *

The pilot said later that after being launched, he had experienced good lift and worked a thermal in company with the other glider. While doing so, both gliders were drifting downwind, but such was their gain in height that it would have been quite possible to get back to the field.

When about three miles downwind from the field, the Bocian broke off and returned to the aerodrome, but at about this time, the pilot of the Skylark found some particularly good lift. Wanting to make the most of it for his endurance attempt, he concentrated on working this



lift to the detriment of noticing that he was continuing to drift away from the field. The pilot admitted he was not paying as much attention to drift as he should have with such a strong wind blowing. When he finally ran out of lift altogether, he found himself at 3,800 feet, but six miles downwind from the field. At the Skylark's normal angle of glide of 24:1, this height would have been more than sufficient to return to the field, but against a 30 knot head-wind, it became a doubtful proposition. The pilot saw this might be so, but decided he would try it anyway.

The pilot said he realised afterwards that when heading directly towards the eastern end of the strip, he was literally flying in "a street of sink", which no doubt accounted for

the continual high rate of descent. When about a mile short of the strip, at 1,800 feet, he had encountered another patch of lift, which he attempted unsuccessfully to work. As a result, he not only lost further height, but again drifted downwind, thus throwing away any hope of reaching the field that might still have remained. At this stage, he assessed a small ploughed field beneath him as suitable for an outlanding, but then, because he thought that his angle of glide would still bring him safely to the field he decided to continue.

Reaching the area immediately downwind from the glider field, the pilot again made a mental assessment of whether he should set up an approach and land there, but as the area was bordered by fences and trees, and he had not previously made an outlanding, he was undecided as to what to do. At this point he encountered a further small area of lift, which made up his mind for him. He kept going,

fell into a level attitude, swinging sharply around to the left through almost 180 degrees as it did so, snapping the fuselage in two midway between the wing and empennage. The wreckage finally came to rest after sliding backwards for 70 feet.

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Although the pilot made an error of judgement in initially thinking he had sufficient height to make a direct flight back to the field, there was no reason why he had to persist with this course of action when its success began to look increasingly doubtful. The pilot admitted he had recognised several cues prompting him to make an outlanding, but for one reason or another, he had rejected them all. There was no dearth of suitable areas in which a successful outlanding could have been made, even right up to the final fence where the line of trees were, but the pilot apparently had a fixation about getting back to the strip as quickly as possible. Had he accepted the possibility of an outlanding in the first place, and gone looking for other areas of lift on either side of the direct track back to the field, he might well have found some which would have enabled him to continue the flight. Even if he had found none, he could still have outlanded normally and been no worse off.

From this accident it seems that glider pilots, especially those who are comparatively new to the sport, need to be constantly reminded that there need be no stigma attached to an outlanding. There can be little doubt that most clubs would prefer to retrieve their glider intact from 60 miles away, rather than from the next paddock in pieces!

CARE IS THE PRICE OF SAFETY—

WE CAN ALL HAVE SAFETY

BUT WE MUST PAY THE PRICE.

Heavy Landing After WINCH FAILURE!

THE pilot involved in this accident was making only his third flight in a Slingsby Skylark.

But although not experienced on the type, he was experienced in the technique of winch launching. Preparations for the launch were normal and after the pilot had given the command for full power, the glider accelerated with a surge and left the ground quite rapidly. The pilot continued to maintain the initial climbing attitude until he had reached about 60 feet and then assumed the full climb attitude, noticing at the same time that the airspeed indicator was reading slightly better than 55 knots. Shortly afterwards, he became aware that the winch had lost power so he lowered the nose of the glider and pulled the release knob.

Assessing his height above the ground, the pilot saw that he would be able to land straight ahead without difficulty and would not need to use the dive brakes. It was only then that he realised the glider was sinking rapidly. He had not been looking at the instruments as he had been concentrating on a visual

approach, but now he realised that the glider was in a stalled condition.

Before he could regain speed, the pilot was forced to level the aircraft for landing and saw that he was going to land heavily. He braced his back and legs to take the shock. As he pulled back on the control column he knew that even if he succeeded in getting the nose up he was approaching the ground too fast to arrest the descent. The aircraft struck the ground heavily in the landing attitude with minimum forward speed. The initial impact, taken on the landing wheel and skid, broke the fuselage in two behind

speed up as though the cable had broken so he declutched the winch, closed the throttle and applied the brake. When he looked up again, he was amazed to see the glider about 70 feet up, and descending rapidly to land again. His impression was that the glider adopted the correct nose-down attitude then levelled out, but its rate of descent remained high.

The evidence of witnesses who were watching the launch indicated that the glider was in a full climb attitude at a height of about 100 feet or less. Also, from the evidence of both the pilot and those watching from



the wing and the wreckage skidded to a halt about 50 feet from the initial point of impact. The pilot was not hurt.

It was learned that the winch driver, soon after he had opened the throttle to full power, had heard an unusual banging noise in the winch. At this stage he looked down the strip and saw the glider was still on the ground. Almost at the same time, he heard the winch engine

the ground, it was apparent that the glider remained in a nose-high attitude until it had almost reached a stalled condition. As a result, its pitch-over to a nose-down attitude was sluggish. In actual fact it was never fully completed as the glider had to be flared for landing before it could fully regain speed.

It was clear that the glider reached an almost stalled con-

dition, either because it was being climbed too steeply, or the pilot was slow in recognising the loss of power from the winch and allowed the speed to decay before lowering the nose. Possibly a combination of both factors was present and the steep climbing attitude resulted in a swifter decay of airspeed than usual. As a result, the aircraft had insufficient speed to recover from the loss of power, and insufficient height to regain speed, before the pilot was forced to flare for landing.

From the point at which the glider pitched over, a safe landing could still have been carried out in the remaining distance of the strip if the aircraft had had sufficient speed. As well, had the aircraft been flying at a significantly higher speed when the power loss occurred, the accident could have been avoided if the loss had been recognised quickly. This margin of speed would have permitted the pilot to assume a nose-down approach attitude almost immediately, and thus have had sufficient speed to flare properly and land.

From the evidence however it is apparent that the glider was in a steep attitude, approximating that of full climb when it should still have been in the flatter attitude of the initial climbing segment. For safe operation, gliders should not take off at steep angles of climb, or adopt the full climbing attitude below 250 feet. During a winch launch the glider in a full climbing attitude reaches a stalled condition in three seconds after a loss of power and it is necessary that a height be achieved from which a glider can be safely recovered from a full stalled condition. Although in this case the take off was jerky and fast, it should not have prevented the pilot stabilising the aircraft in the initial climb segment at the correct angle and abandoning the launch in that segment when the aircraft did not continue to accelerate. However as the pilot was inexperienced on this type of aircraft, it would probably be more accurate to say that he allowed the aircraft to assume a steep climbing attitude, rather than that he initiated the climb in this attitude. Whatever the reason, the accident resulted from the fact that the pilot, who was inexperienced on the type, permitted the aircraft to adopt a full climb attitude too soon after take off.

EVERY LANDING A FORCED LANDING?

Yes, but it need not be like this!

Don't leave your outlanding decision too late!



EDITOR'S LAMENT

Getting out a publication has its problems. If we print jokes, some readers call us adolescent . . . if we don't the book is too serious. If we change author's copy, we're too critical . . . if we don't, we are reproved for slipshod editing! If we appeal for contributions we're too pushy . . . if we re-print items from other publications we're too lazy. You might even say we borrowed this item . . . well you're absolutely right, we did!